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10/719,550	11/21/2003	Chih-Chun Yang	67,200-1109	3429
<div>7590 06/01/2007</div> <div>TUNG & ASSOCIATES Suite 120 838 W. Long Lake Road Bloomfield Hills, MI 48302</div> <div>EXAMINER CHEN, KIN CHAN</div> <div>ART UNIT PAPER NUMBER</div> <div>1765</div> <div>MAIL DATE DELIVERY MODE</div> <div>06/01/2007 PAPER</div>				

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/719,550
Filing Date: November 21, 2003
Appellant(s): YANG ET AL.

MAILED
JUN 01 2007
GROUP 1700

Randy W. Tung
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 20, 2007 appealing from the Office action mailed February 14, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

The examiner removes the rejection of claim 23 under 35 U.S.C. 112, first paragraph and considers it a typographic error in light of the response from appellant (appeal brief, p14/33, the second paragraph), appellant states that "dyglycolamine" is misspelled and it should be "diglycolamine".

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2003/0228990	LEE et al.	12-2003
6,235,644	CHOU	05-2001

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6,355,553	SHINOHARA	03-2002
5,227,337	KADOMURA	07-1993
5,972,123	VERHAVERBEKE	10-1999

S.Wolf et al. "Silicon Processing for the VLSI Era", vol. 1, 1986, page 517.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 13-15, 17, 19, and 21-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 13, line 7, "without photoresist present" is new matter.

Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement. Ex parte Parks, 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993). The mere absence of a positive recitation is not basis for an exclusion. Specification must clearly set forth an explicit definition. Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d985, 989 (Fed.Cir. 1999).

In claims 21 and 24, line 2, alkanolamine (or alkanolamines) is new matter. The disclosure does not support a **broad meaning for the claim terms** were premised on clear statements in the written description.

Claims 1,2,5,9,10,12-14,17, and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 2003/0228990) in view of admitted prior art as

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evidenced by Chou (US 6,235,644), Shinohara (US 6,355,553) and Kadomura (US 5,227,337).

Lee et al. (abstract; [0001] [0061] [0086] [101], Table II of P. 19) teaches a process for removing residues from a structure. The structure may contain exposed tungsten [0001]. An oxidant solution (e.g., hydroxylamine, see abstract or Table II of page 19) may be provided. The oxidant solution may be heated to about 80 degrees C from about 60 degrees C and applied to the structure. Lee does not disclose removing the residue from tungsten etch-back process (so-called planarizing in instant claims). However, the disclosure of Lee is not limited to any particular structure but teaches remove the residues from the exposed tungsten. Hence, it would have been obvious to one with ordinary skill in the art to apply the process of Lee to the conventional process and product to remove the residues from the exposed tungsten in the art of semiconductor device fabrication. The admitted prior art (Fig. 1B to 1D; page 4, line 13 through page 5, line 9 of the specification) is only relied on to show the well-known tungsten etch-back process (so-called planarizing in instant claims) and product in the art of semiconductor device fabrication. The admitted prior art teaches that a tungsten layer may be provided, overlying a dielectric layer to fill an opening formed in the dielectric layer. A metal (tungsten) layer may be planarized (or etch-back processed without photoresist present in instant claims) to form a metal plug structure and leave metal residues on the metal plug structure, see also Chou (US 6,235,644) as evidence. Chou (US 6,235,644; col. 3, lines 39-47) teaches conventional tungsten etch-back process to form a tungsten plug structure. Because it is a well-known process and

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product and because it is disclosed by admitted prior art, hence, it would have been obvious to one with ordinary skill in the art to incorporate said well-known process and product in the process of Lee in order to meet specific product requirement. As such, the combined prior art teach applying the oxidant solution to the metal plug structure to remove the metal residues. Since the oxidant solution is in contact with the metal residues, the metal residues comprising oxidized metal (tungsten) is expected.

As to dependent claims 2, 10, 14, and 21-24, Lee teaches said ingredients in the oxidant solution, see abstract, [101], and Table II of page 19.

Claim 25 differs from the combined prior art by specifying conventional two-step tungsten etchback process to the art of semiconductor device fabrication. A person having ordinary skill in the art would have found it obvious to modify the combined prior art by using conventional process to same in order to reduce overetching and the loading effect with a reasonable expectation of success. See Shinohara (US 6,355,553) and Kadomura (US 5,227,337) as evidence. Shinohara (US 6,355,553; col. 3, lines 56-59; col. 10, lines 5-18) and Kadomura (US 5,227,337; Figs. 3a-3c and descriptions of these Figures) disclose the conventional two-step tungsten etchback process to the art of semiconductor device fabrication.

Claims 3, 7, 11, 15, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee and admitted prior art as applied to claims 1,2,5,9,10,12-14,17, and 21-25 above, and further in view of Wolf (Silicon processing, vol. 1, page 517) or Verhaverbeke (US 5,972,123; col. 4, line 55 through col. 5, line 4).

The discussion of modified Lee and admitted prior art from above is repeated here.

The instant claims differ from Lee and admitted prior art by specifying using conventional spraying method to apply the wet etching /or cleaning solution. Wolf or Verhaverbeke is only relied on to show conventional spraying method to apply the wet etching /or cleaning solution. Because it is a conventional method and because it is disclosed by Wolf or Verhaverbeke, hence, it would have been obvious to one with ordinary skill in the art to use spraying method in the process of Lee and admitted prior art in order to efficiently carry out the wet etching /or cleaning process.

(10) Response to Argument

Appellants have argued that “without photoresist present” is clearly shown by appellants in Figures 2B and 2C. It is not persuasive. As the case law cited by the examiner, the mere absence of a positive recitation is not basis for an exclusion. Specification must clearly set forth an explicit definition.

Appellants have argued that Appellants have explicitly discloses two “alkanolamines (such as monoethanolamine and monoisopropanolamine) and therefore justifies generic claim. It is not persuasive. As has been stated in the office action, the disclosure does not support a **broad meaning for the claim terms** were premised on clear statements in the written description.

Appellants have argued that nowhere do Lee et al. disclose a metal planarization (such as metal etchback process) or oxidized metal residues, or oxidant solution. It is not persuasive. As stated in the office action, Lee et al. teaches a process for removing

residues from a structure. The structure may contain exposed tungsten [0001]. An oxidant solution (e.g., hydroxylamine, see abstract or Table II of page 19) may be provided. Lee does not disclose removing the residue from tungsten etch-back process (so-called planarizing in instant claims). However, the disclosure of Lee is not limited to any particular structure but teaches remove the residues from the exposed tungsten. Hence, it would have been obvious to one with ordinary skill in the art to apply the process of Lee to the conventional process and product to remove the residues from the exposed tungsten in the art of semiconductor device fabrication. The admitted prior art (Fig. 1B to 1D; page 4, line 13 through page 5, line 9 of the specification) and Chou (US 6,235,644) are relied on to show the well-known tungsten etch-back process (so-called planarizing in instant claims). Because it is a well-known process and product and because it is disclosed by admitted prior art, hence, it would have been obvious to one with ordinary skill in the art to incorporate said well-known process and product in the process of Lee in order to meet specific product requirement.

One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In re Merck & Co., Inc., 800F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggesting, or motivation to do so found either in the reference, or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

In the instant case, the examiner has clearly established the knowledge generally available to one of ordinary skill in the art by discussing the teachings of **admitted prior art and Chou.**

As to pages 18-19 of appeal brief, the examiner would like to remind appellants that mere reiteration of claim recitation (e.g., prior art does not teach all limitations) does not constitute an argument within the meaning of 37 CFR 1.192(c) (7)(8). The argument needs to specify the errors in the rejection and the specific limitations in the rejected claims which are not described in the prior art relied upon in the rejection, and an explanation how such limitations render the claimed subject matter unobvious over the prior art.

Appellants have argued that there is no motivation to combine the teachings of Lee et al. and Wolf or Verhaverbeke. It is not persuasive. As has been stated in the office action, the instant claims differ from Lee by specifying using conventional spraying method to apply the wet etching /or cleaning solution. Wolf or Verhaverbeke is only relied on to show conventional spraying method to apply the wet etching /or cleaning solution. Because it is a conventional method and because it is disclosed by Wolf or Verhaverbeke, hence, it would have been obvious to one with ordinary skill in the art to use spraying method in the process of Lee and admitted prior art in order to efficiently carry out the wet etching /or cleaning process.

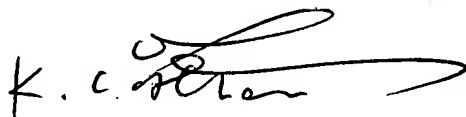
(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Kin-Chan Chen
Primary Examiner
Art Unit 1765

May 1, 2007.

Conferees:

Nadine Norton

Jennifer K. Michener



JENNIFER MICHENER
QUALITY ASSURANCE SPECIALIST